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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/830,169

04/22/2004

Hiroyuki Shinbata

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EXAMINER

WOLDEMARIAM, AKILILU K

ART UNIT

PAPER NUMBER

2609

MAIL DATE

DELIVERY MODE

09/06/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/830,169

Applicant(s)

SHINBATA, HIROYUKI

Examiner

Aklilu k. Woldemariam

Art Unit

2609

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2005.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-16 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 22 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 01/03/2005
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on January 03, 2005 was filed after the mailing date of January 03, 2005. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner is considering the information disclosure statement.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1-4, 6-11, 13 and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeo, hereinafter, Takeo (U.S. Publication number 2002/0062075A1) in view of Shiratani et al., thereinafter, Shiratani (U.S. Patent number 6,418,238 B1).

Regarding claims 1 and 8, Takeo discloses a diagnosis support apparatus and method which supports diagnosis by processing an image (see item 10, fig.1), comprising an enhancement unit configured to enhance a circular shadow (page

2, paragraph [0018] lines 4-7) **existing in an image by enhancing a pixel value gradient of the circular shadow** (see page 5, paragraph [0066] lines 1-5).

Takeo does not disclose **an extraction unit configured to extract an isolated shadow**.

However, Shiratani discloses **an extraction unit configured to extract an isolated shadow** (see items 11-15, fig.1 and fig.3, and column 3, line 44, isolated shadow referred as to tumor point).

It would have been obvious to someone of the ordinary skill in the art at the time when the invention was made to use Shiratani's an extraction unit configured to extract an isolated shadow in Takeo's a diagnosis support apparatus and method which supports diagnosis by processing an image because it defines extraction process clearly, [Shiratani's, see items 11-15 and fig.1].

Regarding claims 2 and 9, Takeo discloses **the apparatus** (see item 10, fig.1) **and method according to claims 1 and 8**, wherein the enhancement unit (see page 2, paragraph [0018] lines 4-7) **enhances the pixel value gradient of the circular shadow** (see page 2, paragraph [0018] lines 1-7 and page 5, paragraph [0066] lines 1-5) **while suppressing an overall pixel value gradient of the image** (page 5, paragraph [0069] lines 1-3, suppressing referred as to containing all the pixels).

Regarding claims 3 and 10, Shiratani discloses **the apparatus and method according to claims 2 and 9**, wherein **calculates a normalized gradient of each pixel of the image** (see column 15, lines 57-59), **and determines a pixel value of a predetermined pixel on the basis of a sum of inner products of normalized**

gradients of a plurality of surrounding pixels (see column 15, lines 57-65) **on a circumference at a predetermined distance from the predetermined pixel and unit vectors extending from the plurality of surrounding pixels to the predetermined pixel** (see column 15, lines 14-19 and column 18, lines 10-13).

Shiratani does not disclose **the enhancement unit**.

However, Takeo discloses **the enhancement unit** (page 2, paragraph [0018] lines 4-7).

It would have been obvious to someone of the ordinary skill in the art at the time when the invention was made to use Takeo's enhancement unit in Shiratani's a diagnosis support apparatus and method which supports diagnosis by processing an image because it defined clearly the enhancement unit, [Takeo's, see item 10, fig.1 and page 2, paragraph [0018] lines 4-7].

Regarding claims 4 and 11, Takeo discloses the apparatus (see item 10, fig.1) **and method according to claims 1 and 8, wherein an isolated shadow** (see page 5, paragraph [0077] line 7) **from the enhanced image by using a morphological filter** (paragraph [0011] lines 1-3 and paragraph [0013] lines 1-2).

Takeo does not disclose **the extraction unit extracts**.

However, Shiratani discloses **the extraction unit extracts** (see items 11-15, fig.1 and fig.3, and column 3, line 44).

It would have been obvious to someone of the ordinary skill in the art at the time when the invention was made to use Shiratani's an extraction unit to extract in Takeo's a diagnosis support apparatus and method which supports diagnosis by processing an

image because it defined clearly the extraction process, [Shiratani's, see items 11-15 and fig.1].

Regarding claims 6 and 13, Shiratani discloses the apparatus and method according to claim 1 and 8, further comprising a labeling unit configured to label a region (see column 14, lines 48-49, labeling region referred as to judging region), of the isolated shadow extracted by the extraction unit (see column 1, lines 15-16, 22 and column 2, line 10 and column 3, line 44), which exhibits a pixel value not less than a predetermined pixel value (see column 13, lines 28-29 and column 18, lines 49-50).

Regarding claims 7 and 14, Takeo discloses the apparatus (see item 10, fig.1) and method according to claims 1 and 8, wherein the apparatus further comprises a generating unit configured to generate a high-frequency image by high-frequency component from the image (see page 2, paragraph [0018] lines 4-7, high-frequency referred as to sharpness-enhancement) and the enhancement unit generates an enhanced image by enhancing a circular shadow existing in the high-frequency image (see page 2, paragraph [0018] lines 4-7 and paragraph [0019] lines 4-6).

Takeo does not disclose **extracting**.

However, Shiratani discloses **extracting** (see items 11-15, fig.1 and fig.3 and column 7, lines 17-18, 31-32 and 54).

It would have been obvious to someone of the ordinary skill in the art at the time when the invention was made to use Shiratani's an extraction unit configured to extract

an isolated shadow in Takeo's a diagnosis support apparatus which supports diagnosis by processing an image because it defined clearly the extracting process, [Shiratani's, see items 11-15, fig.1].

5. **Claims 5, 12, 15 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeo in view of Shiratani as applied to claims 1 and 8 above, and further in view of Acharya et al., "Acharya" (U.S. Patent number 6, 094, 508).

Regarding claims 5 and 12, Takeo and shiratani disclose **the apparatus** (see item 10, fig.1) **and method according to claims 1 and 8**, wherein the extraction unit (see fig.1, column 1, lines 15, 22 and column 3, line 44), **which are located within a first predetermined distance from the predetermined pixel** (see column 18, lines 10-12 and 16-20), **and located at not less than a second predetermined distance and within a third predetermined distance from the predetermined pixel**, and **sets a difference between the first pixel value and the second pixel value as a value of the predetermined pixel** (see column 18, lines 10-12 and 16-20).

Takeo and Shiratani do not disclose **acquires, as a first pixel value, a maximum pixel value from all pixels, of the respective pixels in the image acquires, as a second pixel value, a maximum pixel value from pixels, and sets a difference between the first pixel value and the second pixel value as a value of the predetermined pixel.**

However, Acharya discloses **acquires, as a first pixel value** (see column 1, lines 16-17), **a maximum pixel value from all pixels** (see column 7, line 4 and column 9, line 50), **of the respective pixels in the image and a second pixel value** (see column

1, lines 16-17), **a maximum pixel value from pixels** (see column 7, line 4 and column 9, line 50), and **sets a difference between the first pixel value and the second pixel value as a value of the predetermined pixel** (see column 13, lines 15-19).

It would have been obvious to someone of the ordinary skill in the art at the time when the invention was made to use Acharya's first pixel values and second pixel values from a maximum pixel values from all pixels in Takeo's and Shiratani's a diagnosis support apparatus which supports diagnosis by processing an image because it will allow to provide an improved edge detector that automatically selects the threshold value from image to image without user intervention, [Acharya's, column 2, lines 38-50].

Regarding claim 15, Acharya discloses a control program for causing a computer to execute a method defined in claim 8 (item 510, column 10, lines 10-16 and 22-30).

Regarding claim 16, Acharya discloses a computer-readable memory storing a control program for causing a computer to execute a method defined in claim 8 (see column 10, lines 30-34 and item 511, fig.5, column 11, lines 37-38).

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aklilu k. Woldemariam whose telephone number is 571-270-3247. The examiner can normally be reached on Monday-Thursday 6:30 a.m-5:00 p.m EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexander Eisen can be reached on 571-272-7687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Alexander Eisen
SPE
Art Unit 2609

A.W.
8/30/2007